Generic and Specific Adaptive Responses of Streptococcus pneumoniae to Challenge with Three Distinct Antimicrobial Peptides, Bacitracin, LL-37, and Nisin

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SUPPLEMENTAL MATERIALS

Table S.1. Complete lists of differentially expressed genes of *S. pneumoniae* D39 exposure to bacitracin, nisin and LL-37 treatment. Genes with a fold change of ≤0.6 or ≥1.5 are indicated in bold.

A. List of genes up-regulated upon **15 min.** treatment with **bacitracin:**

Gene ID	Ratio	Bayes.p	NCBI annotation
SP0385	**2.1**	**2.40E-04**	**conserved hypothetical protein**
SP0386	**2.4**	**1.98E-05**	**putative sensor histidine kinase**
SP0387	**2.1**	**1.45E-04**	**DNA-binding response regulator**
SP0390	**2.1**	**1.77E-04**	**choline binding protein G**
SP0391	**2.0**	**2.76E-04**	**choline binding protein F**
SP0419	**1.8**	**5.79E-04**	**enoyl-(acyl-carrier-protein) reductase, *fabK***
SP0420	**1.9**	**4.07E-04**	**CoA-acyl carrier protein transacylase, *fabD***
SP0421	**2.0**	**1.25E-04**	**3-oxoacyl-[acyl-carrier protein] reductase, *fabG***
SP0422	**2.2**	**6.31E-05**	**3-oxoacyl-(acyl-carrier-protein) synthase II, *fabF***
SP0424	**2.2**	**4.39E-05**	**(3R)-hydroxymyristoyl-(acyl-carrier-protein) dehydratase, *fabZ***
SP0426	**2.1**	**2.19E-04**	**acetyl-CoA carboxylase, carboxyl transferase, beta subunit, *accD***
SP0427	**2.4**	**1.54E-04**	**acetyl-CoA carboxylase, carboxyl transferase, alpha subunit, *accA***
SP0430	**2.3**	**7.12E-05**	**conserved domain protein**
SP0785	**1.8**	**1.92E-04**	**conserved hypothetical protein**
SP0786	**2.0**	**1.82E-04**	**ABC transporter, ATP-binding protein**
SP0787	**1.8**	**3.65E-04**	**conserved hypothetical protein**
SP0861	**1.7**	**4.39E-04**	**hypothetical protein**
SP0910	**1.6**	**4.96E-04**	**conserved hypothetical protein**
SP0912	**8.2**	**8.26E-11**	**ABC transporter, ATP-binding protein**
SP0913	**12.4**	**3.07E-10**	**putative ABC transporter, permease protein**
SP1356	**1.7**	**6.21E-04**	**amidohydrolase family protein**
SP1480	**1.4**	**7.87E-04**	**hypothetical protein**
SP1714	**2.9**	**5.93E-06**	**transcriptional regulator, GntR family**
SP1715	**2.3**	**1.20E-04**	**ABC transporter, ATP-binding protein**

SP1925	**1.8**	**6.85E-04**	**hypothetical protein**
SP1926	**1.8**	**7.32E-04**	**hypothetical protein**
SP2086	**1.9**	**9.20E-04**	**phosphate ABC transporter, permease protein, *pstA***

B. List of genes differentially expressed upon **30 min.** treatment with **bacitracin:**

up-regulated genes				down-regulated genes			
Gene ID	**Ratio**	**Bayes.p**	**NCBI annotation**	**Gene ID**	**Ratio**	**Bayes.p**	**NCBI annotation**
SP0069	**1.8**	**3.87E-05**	**choline binding protein I, *cbpI***	***SP0005***	**0.5**	**4.41E-06**	**peptidyl-tRNA hydrolase**
SP0088	**2.1**	**2.94E-05**	**hypothetical protein**	***SP0095***	**0.2**	**2.68E-09**	**conserved hypothetical protein**
SP0101	**2.1**	**4.98E-06**	**putative transporter**	***SP0117***	**0.5**	**3.06E-05**	**pneumococcal surface protein A, *pspA***
SP0107	**2.4**	**2.14E-06**	**LysM domain protein**	***SP0281***	**0.5**	**3.47E-05**	**aminopeptidase C**
SP0142	**2.0**	**2.39E-05**	**hypothetical protein**	***SP0285***	**0.5**	**2.88E-06**	**alcohol dehydrogenase, zinc-containing**
SP0157	**2.0**	**5.73E-05**	**hypothetical protein**	***SP0366***	**0.6**	**6.66E-05**	**oligopeptide ABC transporter, oligopeptide-binding protein AliA**
SP0189	**2.0**	**8.66E-06**	**conserved hypothetical protein**	***SP0400***	**0.5**	**1.45E-05**	**trigger factor**
SP0275	**2.3**	**5.13E-06**	**conserved hypothetical protein**	***SP0430***	**0.5**	**3.79E-06**	**conserved domain protein**
SP0276	**1.9**	**8.91E-05**	**conserved hypothetical protein**	***SP0435***	**0.5**	**3.93E-05**	**translation elongation factor P, *efp***
SP0278	**2.1**	**3.62E-06**	**hypothetical protein**	***SP0453***	**0.6**	**9.90E-05**	**amino acid ABC transporter, amino acid-binding protein/permease protein**
SP0338	**3.1**	**8.59E-09**	**putative ATP-dependent Clp protease, ATP-binding subunit**	***SP0458***	**0.5**	**1.68E-05**	**DNA-damage inducible protein P**
SP0369	**1.9**	**1.53E-05**	**penicillin-binding protein 1A**	***SP0459***	**0.4**	**2.98E-08**	**formate acetyltransferase**
SP0370	**1.8**	**4.70E-05**	**recombination protein U**	***SP0516***	**0.6**	**2.46E-05**	**heat shock protein GrpE**
SP0371	**2.0**	**3.35E-05**	**conserved hypothetical protein**	***SP0565***	**0.4**	**6.87E-07**	**conserved domain protein**
SP0391	**1.7**	**9.72E-05**	**choline binding protein F**	***SP0566***	**0.4**	**1.02E-06**	**acetyltransferase, GNAT family**

SP0408	**2.6**	**2.29E-07**	**sodium:alanine symporter family protein**	***SP0568***	**0.5**	**1.87E-06**	**valyl-tRNA synthetase, *valS***
SP0487	**1.9**	**9.29E-05**	**hypothetical protein**	***SP0577***	**0.4**	**1.33E-06**	**PTS system, beta-glucosides-specific IIABC omponents**
SP0488	**1.9**	**2.19E-06**	**conserved hypothetical protein**	***SP0579***	**0.5**	**2.73E-05**	**phenylalanyl-tRNA synthetase, alpha subunit, *pheS***
SP0582	**2.5**	**2.41E-07**	**hypothetical protein**	***SP0580***	**0.6**	**5.64E-05**	**acetyltransferase, GNAT family**
SP0607	**2.3**	**4.15E-07**	**amino acid ABC transporter, permease protein**	***SP0581***	**0.5**	**1.43E-06**	**phenylalanyl-tRNA synthetase, beta subunit, pheT**
SP0608	**1.9**	**1.59E-05**	**amino acid ABC transporter, permease protein**	***SP0614***	**0.6**	**3.75E-05**	**tributyrin esterase, *estA***
SP0609	**1.9**	**1.34E-05**	**amino acid ABC transporter, amino acid-binding protein**	***SP0626***	**0.4**	**6.29E-07**	**branched-chain amino acid transport system II carrier protein brnQ**
SP0641	**3.0**	**1.26E-08**	**serine protease, subtilase family**	***SP0644***	**0.4**	**6.40E-06**	**hypothetical protein, truncation**
SP0709	**1.7**	**5.81E-05**	**amino acid ABC transporter, ATP-binding protein**	***SP0673***	**0.6**	**4.40E-05**	**hypothetical protein**
SP0785	**2.1**	**1.98E-06**	**conserved hypothetical protein**	***SP0731***	**0.5**	**1.48E-06**	**conserved domain protein**
SP0786	**2.3**	**3.40E-07**	**ABC transporter, ATP-binding protein**	***SP0736***	**0.6**	**7.06E-05**	**mannose-6-phosphate isomerase, *manA***
SP0787	**2.4**	**5.55E-07**	**conserved hypothetical protein**	***SP0742***	**0.4**	**1.23E-07**	**conserved hypothetical protein**
SP0790	**2.3**	**2.89E-06**	**conserved domain protein**	***SP0745***	**0.6**	**8.51E-05**	**uracil phosphoribosyltransferase**
SP0800	**1.9**	**3.76E-05**	**hypothetical protein**	***SP0770***	**0.6**	**4.67E-05**	**ABC transporter, ATP-binding protein**
SP0873	**2.0**	**6.25E-06**	**membrane protein**	***SP0775***	**0.5**	**2.09E-06**	**ribosomal protein S16, *rpsP***
SP0875	**2.1**	**2.56E-07**	**lactose phosphotransferase system repressor**	***SP0869***	**0.6**	**3.74E-05**	**aminotransferase, class-V**
SP0876	**2.2**	**2.30E-07**	**putative 1-phosphofructokinase**	***SP0870***	**0.5**	**5.24E-06**	**NifU family protein**
SP0877	**1.6**	**9.19E-05**	**PTS system, fructose specific IIABC components**	***SP0871***	**0.6**	**6.61E-05**	**conserved hypothetical protein**
SP0910	**2.1**	**4.07E-07**	**conserved hypothetical protein**	***SP0920***	**0.6**	**2.77E-05**	**carboxynorspermidine decarboxylase, nspC**
SP0912	**8.7**	**1.76E-12**	**ABC transporter, ATP-binding protein**	***SP0922***	**0.6**	**1.05E-05**	**carbon-nitrogen hydrolase family protein**
SP0913	**9.6**	**8.73E-11**	**putative ABC transporter, permease protein**	***SP1071***	**0.5**	**4.18E-05**	**ABC transporter, ATP-binding protein**
SP1025	**1.8**	**5.31E-05**	**hypothetical protein**	***SP1117***	**0.4**	**2.28E-06**	**DNA ligase, NAD-dependent, ligA**
SP1148	**1.9**	**7.03E-05**	**IS630-Spn1, transposase Orf2**	***SP1121***	**0.4**	**5.82E-06**	**hypothetical protein**
SP1343	**1.8**	**3.83E-06**	**prolyl oligopeptidase family protein**	***SP1122***	**0.5**	**9.90E-05**	**glucose-1-phosphate adenylyltransferase, glgC**

SP1344	**1.9**	**5.84E-06**	**conserved hypothetical protein**	***SP1175***	**0.5**	**2.17E-05**	**conserved domain protein**
SP1422	**1.7**	**9.79E-05**	**hypothetical protein**	***SP1383***	**0.3**	**7.29E-08**	**alanyl-tRNA synthetase, alaS**
SP1480	**1.8**	**8.38E-05**	**hypothetical protein**	***SP1384***	**0.5**	**9.53E-07**	**conserved hypothetical protein**
SP1588	**2.2**	**7.12E-07**	**oxidoreductase, pyridine nucleotide-disulfide, class I**	***SP1441***	**0.5**	**8.21E-07**	**IS66 family element, Orf3, degenerate**
SP1646	**1.6**	**9.41E-05**	**metallo-beta-lactamase superfamily protein**	***SP1468***	**0.6**	**7.97E-05**	**pyridoxine biosynthesis protein**
SP1648	**2.5**	**3.13E-08**	**manganese ABC transporter, ATP-binding protein,psaB**	***SP1474***	**0.5**	**1.25E-06**	**glycyl-tRNA synthetase, beta subunit, glyS**
SP1649	**2.6**	**1.51E-06**	**putative manganese ABC transporter, permease, psaC**	***SP1477***	**0.5**	**2.22E-06**	**hypothetical protein**
SP1674	**1.9**	**3.60E-06**	**putative phosphosugar-binding transcriptional regulator**	***SP1531***	**0.5**	**2.29E-05**	**hypothetical protein**
SP1683	**2.9**	**1.00E-07**	**sugar ABC transporter, sugar-binding protein**	***SP1533***	**0.5**	**3.19E-05**	**conserved domain protein**
SP1774	**2.2**	**4.56E-07**	**putative transcriptional regulator**	***SP1576***	**0.4**	**1.45E-07**	**homoserine O-succinyltransferase, metA**
SP1786	**3.0**	**6.80E-08**	**conserved hypothetical protein**	***SP1577***	**0.5**	**3.45E-05**	**adenine phosphoribosyltransferase, apt**
SP1787	**2.3**	**1.48E-06**	**hypothetical protein**	***SP1630***	**0.3**	**1.39E-08**	**hypothetical protein**
SP1854	**2.0**	**8.24E-05**	**galactose operon repressor, *galR***	***SP1631***	**0.4**	**5.92E-08**	**threonyl-tRNA synthetase, thrS**
SP1885	**2.0**	**2.18E-05**	**trehalose operon transcriptional repressor, *treR***	***SP1651***	**0.4**	**4.36E-06**	**thiol peroxidase, psaD**
SP2060	**1.9**	**1.26E-05**	**pyrrolidone-carboxylate peptidase, pcp-2**	***SP1659***	**0.4**	**1.10E-06**	**isoleucyl-tRNA synthetase**
SP2062	**2.0**	**6.08E-05**	**transcriptional regulator, MarR family**	***SP1661***	**0.6**	**1.10E-05**	**cell division protein DivIVA**
SP2063	**7.4**	**1.65E-10**	**LysM domain protein**	***SP1673***	**0.6**	**8.38E-06**	**penicillin-binding protein 2B, *penA***
SP2084	**2.5**	**1.78E-07**	**phosphate ABC transporter, phosphate-binding protein, *pstS***	***SP1695***	**0.6**	**2.52E-05**	**putative acetyl xylan esterase**
SP2086	**1.9**	**8.29E-05**	**phosphate ABC transporter, permease protein, *pstA***	***SP1743***	**0.6**	**1.41E-05**	**conserved hypothetical protein**
SP2087	**2.1**	**1.52E-06**	**phosphate ABC transporter, ATP-binding protein, *pstB***	***SP1906***	**0.6**	**3.89E-05**	**chaperonin, 60 kDa**
SP2088	**1.8**	**3.84E-05**	**phosphate transport system regulatory protein PhoU**	***SP2026***	**0.4**	**3.78E-06**	**alcohol dehydrogenase, iron-containing**
SP2136	**3.6**	**2.70E-09**	**choline binding protein PcpA**	***SP2055***	**0.5**	**1.12E-06**	**alcohol dehydrogenase, zinc-containing**
SP2197	**1.8**	**1.44E-05**	**putative ABC transporter, substrate-binding protein**	***SP2134***	**0.6**	**2.65E-05**	**ribosomal protein L32, *rpmF***
SP2199	**1.9**	**1.28E-05**	**conserved hypothetical protein**	***SP2188***	**0.6**	**3.03E-05**	**chaperonin, 33 kDa, hslO**

				SP2189	**0.6**	**3.81E-05**	**putative TIM-barrel protein, NifR3 family**
				SP2239	**0.5**	**2.84E-05**	**serine protease**
				SP2240	**0.5**	**7.31E-05**	**spspoJ protein**

C. List of genes differentially expressed upon **15 min.** treatment with **nisin:**

up-regulated genes				down-regulated genes			
Gene ID	**Ratio**	**Bayes.p**	**NCBI annotation**	**Gene ID**	**Ratio**	**Bayes.p**	**NCBI annotation**
SP0185	1.3	7.81E-04	magnesium transporter, CorA family	*SP0229*	0.8	6.51E-04	ribosomal protein L15, *rplO*
SP0335	1.4	2.99E-05	cell division protein FtsL	*SP0230*	0.7	7.11E-05	preprotein translocase, SecY subunit, *secY*
SP0415	1.4	5.77E-05	enoyl-CoA hydratase/isomerase family protein	*SP0237*	0.7	2.26E-04	ribosomal protein L17, *rplQ*
SP0416	1.3	5.09E-04	transcriptional regulator, MarR family	*SP0285*	0.7	1.32E-04	alcohol dehydrogenase, zinc-containing
SP0641	1.3	2.33E-04	serine protease, subtilase family	*SP0366*	0.7	8.16E-05	oligopeptide ABC transporter, oligopeptide-binding protein AliA
SP0664	1.3	5.63E-04	zinc metalloprotease ZmpB	***SP0441***	**0.6**	**6.31E-06**	**ribosomal protein L28**
SP0851	**1.5**	**7.05E-05**	**conserved hypothetical protein**	***SP0501***	**0.5**	**3.15E-06**	**transcriptional regulator, MerR family**
SP0875	**1.6**	**1.01E-05**	**lactose phosphotransferase system repressor**	***SP0502***	**0.5**	**6.55E-05**	**glutamine synthetase, type I**
SP0876	**1.7**	**2.56E-06**	**putative 1-phosphofructokinase**	*SP0557*	0.7	3.17E-04	ribosome-binding factor A, *rbfA*
SP0912	**9.1**	**1.40E-12**	**ABC transporter, ATP-binding protein**	***SP0577***	**0.6**	**2.84E-06**	**PTS system, beta-glucosides-specific IIABC omponents**
SP0913	**13.3**	**5.84E-13**	**putative ABC transporter, permease protein**	***SP0578***	**0.6**	**3.17E-06**	**6-phospho-beta-glucosidase, *bglA*-2**
SP0914	**1.6**	**6.77E-05**	**nodulin-related protein, truncation**	***SP0645***	**0.6**	**1.06E-05**	**putative PTS system IIA component**
SP1178	**1.3**	**3.08E-04**	**NrdH-redoxin**	*SP0670*	0.7	1.46E-04	hypothetical protein
SP1343	1.3	5.41E-04	prolyl oligopeptidase family protein	*SP0731*	0.7	1.24E-04	conserved domain protein
SP1578	1.4	6.75E-04	putative methyltransferase	*SP0838*	0.7	1.87E-04	ribosomal protein S20, *rpsT*
SP1588	1.3	6.36E-04	oxidoreductase, pyridine nucleotide-disulfide, class I	*SP0922*	0.7	2.84E-04	carbon-nitrogen hydrolase family protein
SP1871	**1.6**	**5.99E-04**	**iron-compound ABC transporter, ATP-binding protein**	*SP0962*	0.8	5.53E-04	lactoylglutathione lyase, *gloA*

SP1872	**1.6**	**2.74E-04**	**iron-compound ABC transporter, iron-compound-binding protein**	*SP1080*	0.7	1.91E-04	hypothetical protein
SP2173	1.3	7.90E-04	dltD protein	*SP1187*	0.6	7.24E-06	transcription antiterminator LacT
SP2216	**1.5**	**5.33E-04**	**secreted 45 kd protein, *usp45***	*SP1220*	0.8	4.62E-04	L-lactate dehydrogenase
				SP1241	**0.5**	**6.49E-06**	**acid ABC transporter, amino acid-binding protein/permease protein**
				SP1242	**0.5**	**8.46E-07**	**amino acid ABC transporter, ATP-binding protein**
				SP1295	0.7	2.10E-04	crcB protein
				SP1297	**0.6**	**5.88E-05**	**flavodoxin**
				SP1306	**0.6**	**7.98E-06**	**NADP-specific glutamate dehydrogenase, *gdhA***
				SP1354	0.7	8.63E-05	ribosomal protein L7/L12, *rplL*
				SP1394	0.8	8.82E-04	amino acid ABC transporter, amino acid-binding protein
				SP1414	0.8	5.80E-04	ribosomal protein S21,*rpsU*
				SP1499	0.7	2.18E-04	bacterocin transport accessory protein
				SP1507	0.7	1.06E-04	ATP synthase F1, epsilon subunit, *atpC*
				SP1531	0.7	1.38E-04	hypothetical protein
				SP1648	0.7	3.46E-04	manganese ABC transporter, ATP-binding protein,psaB
				SP1649	0.8	2.98E-04	putative manganese ABC transporter, permease, psaC
				SP1864	0.7	3.17E-04	conserved hypothetical protein
				SP1959	0.7	2.25E-04	nucleoside diphosphate kinase
				SP1970	0.7	1.90E-04	aspartate--ammonia ligase, *asnA*
				SP1996	0.7	9.24E-05	universal stress protein family
				SP2055	0.7	5.72E-04	alcohol dehydrogenase, zinc-containing
				SP2108	0.7	6.14E-04	maltose/maltodextrin ABC transporter, maltose/maltodextrin-binding protein, *malX*
				SP2126	0.7	3.78E-04	dihydroxy-acid dehydratase, *ilvD*

D. List of genes differentially expressed upon **30 min.** treatment with **nisin:**

up-regulated genes	down-regulated genes

Gene ID	Ratio	Bayes.p	NCBI annotation	Gene ID	Ratio	Bayes.p	NCBI annotation
SP0148	**1.6**	**4.09E-04**	**ABC transporter, substrate-binding protein**	*SP0496*	0.7	4.22E-04	Na/Pi cotransporter II-related protein
SP0415	**2.0**	**6.16E-04**	**enoyl-CoA hydratase/isomerase family protein**	***SP0501***	**0.4**	**1.54E-06**	**transcriptional regulator, MerR family**
SP0419	**2.0**	**5.08E-04**	**enoyl-(acyl-carrier-protein) reductase**	***SP0502***	**0.5**	**5.47E-06**	**glutamine synthetase, type I**
SP0422	**2.2**	**1.62E-04**	**3-oxoacyl-(acyl-carrier-protein) synthase II, *fabF***	***SP1160***	**0.5**	**1.14E-04**	**putative lipoate-protein ligase**
SP0875	**1.5**	**8.49E-04**	**lactose phosphotransferase system repressor**	***SP1241***	**0.6**	**1.55E-04**	**acid ABC transporter, amino acid-binding protein/permease protein**
SP0876	**1.6**	**3.68E-05**	**putative 1-phosphofructokinase**	***SP1242***	**0.6**	**4.04E-05**	**amino acid ABC transporter, ATP-binding protein**
SP0912	**6.0**	**4.38E-09**	**ABC transporter, ATP-binding protein**	***SP1648***	**0.6**	**1.26E-05**	**manganese ABC transporter, ATP-binding protein,psaB**
SP0913	**11.9**	**4.14E-12**	**putative ABC transporter, permease protein**	***SP1649***	**0.6**	**2.09E-05**	**putative manganese ABC transporter, permease, psaC**
SP1588	**1.8**	**3.89E-06**	**oxidoreductase, pyridine nucleotide-disulfide, class I**	*SP1664*	0.7	7.90E-04	ylmF protein
SP1869	**1.7**	**3.36E-04**	**iron-compound ABC transporter, permease protein**	***SP2136***	**0.6**	**2.62E-05**	**choline binding protein PcpA**
SP1870	**2.5**	**7.42E-06**	**iron-compound ABC transporter, permease protein**				
SP1871	**1.9**	**3.85E-04**	**iron-compound ABC transporter, ATP-binding protein**				
SP1872	**1.8**	**5.11E-04**	**iron-compound ABC transporter, iron-compound-binding protein**				
SP2062	**1.6**	**7.32E-04**	**transcriptional regulator, MarR family**				
SP2063	**1.9**	**1.29E-04**	**LysM domain protein**				

E. List of genes differentially expressed upon **15 min.** treatment with **LL-37:**

up-regulated genes				down-regulated genes			
Gene ID	**Ratio**	**Bayes.p**	**NCBI annotation**	**Gene ID**	**Ratio**	**Bayes.p**	**NCBI annotation**

SP0001	1.4	5.73E-05	chromosomal replication initiator protein DnaA	*SP0004*	0.8	1.14E-04	GTP-binding protein
SP0055	1.3	3.16E-04	Hypothetical protein	*SP0008*	0.8	6.32E-04	Hypothetical protein
SP0056	1.3	9.36E-04	adenylosuccinate lyase	***SP0024***	**0.6**	**1.47E-07**	**conserved hypothetical protein**
SP0071	**1.5**	**6.03E-04**	**zinc metalloprotease ZmpC**	*SP0025*	0.8	3.97E-04	Hypothetical protein
SP0088	**1.5**	**3.08E-06**	**Hypothetical protein**	***SP0026***	**0.6**	**1.59E-06**	**Hypothetical protein**
SP0089	1.4	4.89E-04	Hypothetical protein	*SP0027*	0.8	2.71E-05	ribose-phosphate pyrophosphokinase
SP0157	**1.7**	**5.99E-08**	**Hypothetical protein**	*SP0032*	0.8	2.69E-04	DNA polymerase I
SP0185	1.3	1.99E-04	magnesium transporter, CorA family	*SP0034*	0.6	3.56E-06	membrane protein
SP0192	1.4	2.66E-05	conserved hypothetical protein	*SP0083*	0.8	2.37E-04	DNA-binding response regulator
SP0194	1.3	2.28E-04	conserved hypothetical protein	*SP0084*	0.7	1.55E-05	sensor histidine kinase
SP0197	1.5	2.94E-06	putative dihydrofolate synthetase	*SP0090*	0.7	9.96E-04	ABC transporter, permease protein
SP0200	1.3	2.98E-04	competence-induced protein Ccs4	*SP0107*	0.7	4.81E-04	LysM domain protein
SP0234	1.3	7.21E-04	ribosomal protein S13	***SP0117***	**0.5**	**4.76E-06**	**pneumococcal surface protein A**
SP0237	**1.7**	**5.03E-07**	**ribosomal protein L17**	*SP0202*	0.8	6.88E-04	anaerobic ribonucleoside-triphosphate reductase
SP0261	**1.5**	**8.59E-06**	**undecaprenyl diphosphate synthase**	***SP0238***	**0.6**	**6.26E-05**	**ACT domain protein**
SP0279	1.4	1.81E-04	conserved hypothetical protein	*SP0239*	0.7	1.24E-04	conserved hypothetical protein
SP0369	**1.8**	**2.06E-08**	**penicillin-binding protein 1A**	*SP0255*	0.7	2.13E-04	acetyltransferase, GNAT family
SP0370	**1.9**	**2.72E-07**	**recombination protein U**	*SP0268*	0.7	2.16E-04	putative alkaline amylopullulanase
SP0372	**1.5**	**3.00E-05**	**conserved hypothetical protein**	*SP0281*	0.7	7.96E-06	aminopeptidase C
SP0374	1.3	4.46E-04	hypothetical protein	***SP0282***	**0.3**	**1.84E-10**	**PTS system, mannose-specific IID component**
SP0385	**1.5**	**2.64E-06**	**conserved hypothetical protein**	***SP0283***	**0.2**	**9.42E-11**	**PTS system, mannose-specific IIC component**
SP0386	**1.5**	**1.55E-06**	**putative sensor histidine kinase**	***SP0284***	**0.2**	**1.37E-11**	**PTS system, mannose-specific IIAB components**
SP0402	1.4	1.40E-05	signal peptidase I	*SP0285*	0.7	2.08E-05	alcohol dehydrogenase, zinc-containing
SP0403	1.3	1.16E-04	ribonuclease HIII	***SP0287***	**0.5**	**1.94E-07**	**xanthine/uracil permease family protein**
SP0404	1.4	2.32E-05	hypothetical protein	*SP0289*	0.7	8.87E-04	dihydropteroate synthase
SP0405	**1.5**	**9.89E-06**	**conserved hypothetical protein**	*SP0290*	0.7	6.65E-06	dihydrofolate synthetase
SP0406	1.2	7.50E-04	MutS2 family protein	*SP0291*	0.7	6.09E-05	GTP cyclohydrolase I
SP0408	**1.9**	**1.20E-06**	**sodium:alanine symporter family protein**	*SP0292*	0.7	7.31E-04	bifunctional folate synthesis protein
SP0415	**1.5**	**1.30E-05**	**enoyl-CoA hydratase/isomerase family protein**	*SP0293*	0.7	7.63E-05	hypothetical protein
SP0416	1.3	3.65E-04	transcriptional regulator, MarR family	***SP0303***	**0.6**	**1.59E-04**	**6-phospho-beta-glucosidase**
SP0417	**1.5**	**6.68E-06**	**3-oxoacyl-(acyl-carrier-protein) synthase**	*SP0341*	0.8	9.71E-05	hypothetical protein

			III				
SP0419	1.4	4.10E-05	enoyl-(acyl-carrier-protein) reductase	***SP0366***	**0.3**	**1.28E-11**	**oligopeptide ABC transporter AliA**
SP0424	1.3	2.28E-04	(3R)-hydroxymyristoyl-(acyl-carrier-protein) dehydratase, *fabZ*	*SP0413*	0.7	1.03E-05	aspartate kinase
SP0427	1.4	9.15E-06	acetyl-CoA carboxylase, carboxyl transferase, alpha subunit, accA	*SP0445*	0.7	1.73E-04	acetolactate synthase, large subunit, biosynthetic type,*ilvB*
SP0457	1.3	2.79E-05	bacitracin resistance protein, *bacA*	***SP0446***	**0.6**	**1.08E-06**	**acetolactate synthase, small subunit, *ilvN***
SP0496	**1.5**	**2.39E-06**	**Na/Pi cotransporter II-related protein**	***SP0447***	**0.6**	**4.01E-06**	**ketol-acid reductoisomerase, *ilvC***
SP0499	1.4	8.94E-05	phosphoglycerate kinase	*SP0448*	0.7	9.48E-05	hypothetical protein
SP0501	**3.1**	**1.52E-10**	**transcriptional regulator, MerR family**	*SP0450*	0.7	4.78E-05	threonine dehydratase, *ilvA*
SP0502	**2.9**	**8.33E-11**	**glutamine synthetase, type I**	*SP0459*	0.7	2.31E-06	formate acetyltransferase
SP0503	**2.7**	**3.04E-07**	**hypothetical protein**	*SP0477*	0.7	1.66E-04	6-phospho-beta-galactosidase, *lacG*-1
SP0504	**1.9**	**7.65E-07**	**hypothetical protein**	*SP0479*	0.8	0.000731	potassium uptake protein, Trk family
SP0524	**2.0**	**6.40E-07**	**BlpT protein, fusion**	***SP0516***	**0.6**	**8.99E-07**	**heat shock protein GrpE**
SP0525	**1.6**	**6.11E-07**	**BlpS protein**	***SP0517***	**0.6**	**8.46E-08**	**DnaK protein**
SP0526	1.4	6.28E-05	response regulator BlpR	*SP0518*	0.7	1.69E-06	hypothetical protein
SP0527	1.4	8.55E-05	putative sensor histidine kinase BlpH	*SP0519*	0.8	5.08E-04	dnaJ protein
SP0529	**1.7**	**8.10E-07**	**BlpB ABC transporter**	*SP0565*	0.7	5.87E-04	conserved domain protein
SP0530	**3.4**	**1.53E-09**	**BlpA ABC transporter**	*SP0566*	0.7	1.25E-04	acetyltransferase, GNAT family
SP0533	**1.5**	**3.41E-05**	**bacteriocin BlpK immunity protein BlpY**	*SP0568*	0.7	2.55E-06	valyl-tRNA synthetase, *valS*
SP0545	**5.1**	**6.74E-12**		***SP0577***	**0.4**	**2.45E-06**	**PTS system, beta-glucosides-specific IIABC components**
SP0546	**3.5**	**5.96E-09**	**BlpZ protein, fusion conserved domain protein**	***SP0578***	**0.3**	**1.38E-06**	**6-phospho-beta-glucosidase**
SP0547	**3.7**	**6.53E-10**		*SP0579*	0.7	8.16E-06	phenylalanyl-tRNA synthetase, alpha subunit, *pheS*
SP0552	1.3	9.69E-04	SP14.3 protein	*SP0581*	0.8	3.65E-04	phenylalanyl-tRNA synthetase, beta subunit, *pheT*
SP0553	1.2	7.22E-04	N utilization substance protein A, *nusA*	*SP0611*	0.8	1.09E-04	single-stranded-DNA-specific exonuclease RecJ
SP0556	1.2	9.61E-04	translation initiation factor IF-2, *infB*	*SP0628*	0.7	5.49E-05	HIT family protein
SP0557	**1.6**	**2.37E-05**	**ribosome-binding factor A, *rbfA***	*SP0637*	0.8	3.79E-04	membrane protein
SP0582	**1.6**	**3.96E-06**	**hypothetical protein**	*SP0638*	0.8	1.06E-04	conserved hypothetical protein
SP0587	**1.6**	**4.17E-04**	**hypothetical protein**	***SP0730***	**0.5**	**7.37E-08**	**pyruvate oxidase**
SP0588	1.2	4.09E-04	polyribonucleotide nucleotidyltransferase	***SP0731***	**0.5**	**8.12E-08**	**conserved domain protein**
SP0589	1.3	1.19E-04	serine acetyltransferase, *cysE*	*SP0736*	0.7	5.05E-04	mannose-6-phosphate isomerase, *manA*
SP0590	1.3	1.03E-04	acetyltransferase, GNAT family	*SP0758*	0.7	9.57E-05	PTS system, IIABC components

SP0591	1.3	3.64E-04	cysteinyl-tRNA synthetase	*SP0770*	0.7	1.67E-04	ABC transporter, ATP-binding protein
SP0592	1.4	3.76E-05	conserved hypothetical protein	*SP0775*	0.7	7.38E-05	ribosomal protein S16
SP0593	1.4	6.12E-06	leucine-rich protein	***SP0845***	**0.5**	**2.03E-07**	**lipoprotein**
SP0617	**2.0**	**6.43E-08**	**conserved domain protein**	*SP0887*	0.7	1.76E-05	putative type I restriction-modification system, S subunit
SP0742	**1.8**	**2.78E-07**	**conserved domain protein**	***SP0916***	**0.6**	**1.01E-04**	**lysine decarboxylase**
SP0748	1.3	4.73E-04	conserved hypothetical protein	***SP0918***	**0.6**	**5.49E-06**	**spermidine synthase, *speE***
SP0762	**1.7**	**2.06E-07**	**S-adenosylmethionine synthetase**	***SP0919***	**0.5**	**1.21E-07**	**conserved hypothetical protein**
SP0783	**2.6**	**5.87E-09**	**conserved hypothetical protein**	***SP0920***	**0.5**	**9.91E-09**	**carboxynorspermidine decarboxylase**
SP0785	**4.1**	**6.34E-12**	**conserved hypothetical protein**	***SP0921***	**0.5**	**1.98E-08**	**conserved hypothetical protein**
SP0786	**5.1**	**2.73E-12**	**ABC transporter, ATP-binding protein**	***SP0922***	**0.5**	**1.09E-05**	**carbon-nitrogen hydrolase family protein**
SP0787	**4.6**	**1.76E-11**	**conserved hypothetical protein**	*SP1013*	0.7	4.82E-05	aspartate-semialdehyde dehydrogenase
SP0789	**1.6**	**8.25E-06**	**conserved hypothetical protein**	***SP1032***	**0.5**	**8.37E-09**	**iron-compound ABC transporter, iron compound-binding protein**
SP0790	**1.5**	**9.27E-06**	**conserved domain protein**	*SP1033*	0.7	2.11E-04	iron-compound ABC transporter, permease protein
SP0798	**2.5**	**2.80E-10**	**DNA-binding response regulator CiaR**	***SP1034***	**0.6**	**2.13E-07**	**iron-compound ABC transporter, permease protein**
SP0799	**2.4**	**4.81E-09**	**sensor histidine kinase CiaH**	***SP1035***	**0.5**	**7.59E-09**	**iron-compound ABC transporter, ATP-binding protein**
SP0800	**1.5**	**1.41E-05**	**hypothetical protein**	***SP1036***	**0.6**	**5.52E-04**	**hypothetical protein**
SP0805	**1.5**	**2.10E-06**	**hydrolase, haloacid dehalogenase-like family**	*SP1037*	0.8	2.89E-04	putative type II restriction endonuclease
SP0829	1.3	1.34E-04	Phosphopentomutase, *deoB*	*SP1038*	0.8	2.63E-04	hypothetical protein
SP0846	1.3	9.65E-04	sugar ABC transporter, ATP-binding protein	***SP1039***	**0.6**	**5.65E-06**	**hypothetical protein**
SP0851	1.4	3.10E-04	conserved hypothetical protein	***SP1040***	**0.6**	**1.23E-06**	**site-specific recombinase, resolvase family**
SP0861	**1.6**	**1.60E-04**	**hypothetical protein**	***SP1041***	**0.6**	**1.31E-05**	**hypothetical protein**
SP0875	**1.7**	**3.98E-04**	**lactose phosphotransferase system repressor**	*SP1069*	0.7	9.57E-05	conserved hypothetical protein
SP0876	**1.8**	**9.06E-04**	**putative 1-phosphofructokinase**	*SP1070*	0.7	2.68E-04	conserved hypothetical protein
SP0877	**2.3**	**5.20E-06**	**SpoE family protein**	*SP1114*	0.8	6.85E-05	ABC transporter, ATP-binding protein
SP0878	**1.5**	**1.35E-06**	**hypothetical protein**	***SP1119***	**0.6**	**1.09E-05**	**glyceraldehyde-3-phosphate dehydrogenase, NADP-dependent, *gapN***
SP0895	1.3	2.86E-05	putative type I restriction-modification system, R subunit	*SP1127*	0.7	3.88E-04	hypothetical protein
SP0904	1.3	8.86E-05	conserved hypothetical protein	*SP1128*	0.7	7.45E-05	enolase

SP0905	1.3	2.95E-04	conserved hypothetical protein	*SP1170*	0.7	4.48E-05	hypothetical protein
SP0910	1.3	2.26E-04	conserved hypothetical protein	*SP1171*	0.7	4.22E-05	hydrolase, haloacid dehalogenase-like family
SP0913	**1.9**	**3.39E-05**	**putative ABC transporter, permease protein**	*SP1175*	0.7	2.83E-04	conserved domain protein
SP0925	**1.5**	**1.08E-04**	**conserved hypothetical protein**	***SP1185***	**0.6**	**1.44E-05**	**PTS system, lactose-specific IIBC components, *lacE*-2**
SP0928	1.2	9.44E-04	signal peptidase II, *lspA*	***SP1186***	**0.5**	**1.85E-05**	**PTS system, lactose-specific IIA component, *lacF*-2**
SP0956	1.4	8.82E-04	hypothetical protein	***SP1187***	**0.5**	**2.75E-06**	**transcription antiterminator LacT**
SP0957	**1.9**	**3.00E-07**	**ABC transporter, ATP-binding protein**	*SP1190*	0.7	1.55E-04	tagatose 1,6-diphosphate aldolase, *lacD*
SP0958	**2.0**	**3.52E-07**	**hypothetical protein**	*SP1191*	0.7	7.79E-04	tagatose-6-phosphate kinase, *lacC*
SP0974	1.4	9.61E-04	putative preprotein translocase, SecG subunit	*SP1192*	0.7	1.86E-05	galactose-6-phosphate isomerase, LacB subunit, *lacB*
SP0975	**1.5**	**1.41E-05**	**exoribonuclease, VacB/Rnb family**	*SP1193*	0.7	2.98E-04	galactose-6-phosphate isomerase, LacA subunit, *lacA*
SP0976	**1.5**	**5.13E-06**	**SsrA-binding protein"**	*SP1212*	0.7	1.97E-05	tRNA pseudouridine synthase B, *truB*
SP0977	**1.6**	**4.65E-06**	**tellurite resistance protein TehB**	***SP1263***	**0.6**	**7.02E-04**	**DNA topoisomerase I, *topA***
SP0981	1.3	1.88E-04	putative protease maturation protein	***SP1298***	**0.6**	**1.06E-08**	**DHH subfamily 1 protein**
SP0987	1.3	2.31E-04	hypothetical protein	*SP1339*	0.7	1.88E-04	hypothetical protein
SP1023	1.3	5.22E-04	acetyltransferase, GNAT family	*SP1345*	0.7	2.59E-04	hypothetical protein
SP1024	1.2	8.22E-04	serine hydroxymethyltransferase, *glyA*	*SP1383*	0.8	3.04E-04	alanyl-tRNA synthetase, *alaS*
SP1027	**3.3**	**8.31E-11**	**conserved hypothetical protein**	*SP1395*	0.7	2.98E-05	putative phosphate transport system regulatory protein PhoU
SP1029	**1.7**	**9.81E-08**	**RNA methyltransferase, TrmA family**	*SP1396*	0.8	1.57E-04	putative phosphate ABC transporter, ATP-binding protein
SP1075	**1.7**	**2.37E-08**	**glycosyl transferase CpoA**	*SP1397*	0.8	9.47E-04	putative phosphate ABC transporter, ATP-binding protein
SP1076	1.4	1.44E-05	glycosyl transferase, group 1	*SP1398*	0.8	5.64E-04	putative phosphate ABC transporter, permease protein
SP1077	**1.6**	**1.07E-06**	**conserved domain protein**	***SP1445***	**0.6**	**1.94E-07**	**GMP synthase, *guaA***
SP1082	1.2	8.51E-04	acetyltransferase, GNAT family	*SP1455*	0.7	2.75E-04	hypothetical protein
SP1093	1.3	7.51E-04	hypothetical protein	*SP1461*	0.8	7.33E-04	amino acid ABC transporter, permease protein
SP1148	1.5	1.88E-05	IS630-Spn1, transposase Orf2	*SP1462*	0.7	8.06E-06	conserved hypothetical protein
SP1149	1.4	2.97E-05	IS630-Spn1, transposase Orf1	***SP1463***	**0.6**	**5.93E-07**	**methylated-DNA--protein-cysteine S-methyltransferase**
SP1151	1.4	8.54E-05	exonuclease RexB	***SP1464***	**0.6**	**1.05E-06**	**acetyltransferase, GNAT family**

			putative acetoin dehydrogenase complex, E3 component, dihydrolipoamide				pyridoxine biosynthesis protein
SP1161	1.4	9.15E-04	dehydrogenase	*SP1468*	0.7	9.65E-05	
			putative acetoin dehydrogenase complex, E2 component, dihydrolipoamide				NADH oxidase
SP1162	1.3	7.77E-04	acetyltransferase	*SP1469*	0.8	5.21E-04	
SP1229	1.3	2.74E-04	formate--tetrahydrofolate ligase	*SP1491*	0.7	1.75E-05	putative glycerol uptake facilitator protein
			amino acid ABC transporter, amino acid-				amino acid ABC transporter, amino acid-
SP1241	**2.4**	**2.27E-09**	**binding protein/permease protein**	*SP1500*	0.7	1.42E-04	binding protein
			amino acid ABC transporter, ATP-				**ATP synthase F1, epsilon subunit, *atpC***
SP1242	**2.7**	**1.23E-09**	**binding protein**	***SP1507***	**0.6**	**4.79E-06**	
SP1243	**1.5**	**3.09E-06**	**glucose-6-phosphate 1-dehydrogenase, *zwf***	***SP1508***	**0.6**	**4.11E-07**	**ATP synthase F1, beta subunit, *atpD***
SP1260	1.3	3.36E-04	copper homeostasis protein CutC	***SP1509***	**0.6**	**2.36E-08**	**ATP synthase F1, gamma subunit, *atpG***
SP1261	1.3	7.39E-04	conserved hypothetical protein	***SP1510***	**0.6**	**3.47E-08**	**ATP synthase F1, alpha subunit, *atpA***
SP1283	**1.5**	**2.81E-06**	**heat shock protein HtpX**	***SP1511***	**0.6**	**1.31E-07**	**ATP synthase F1, delta subunit, *atpH***
SP1284	1.3	4.00E-04	lemA protein	***SP1512***	**0.6**	**5.14E-08**	**ATP synthase F0, B subunit, *atpF***
SP1299	1.3	8.50E-04	ribosomal protein L31, *rpmE*	***SP1513***	**0.6**	**1.44E-07**	**ATP synthase F0, A subunit, *atpB***
SP1305	**1.8**	**1.13E-04**	**hypothetical protein**	*SP1517*	0.8	5.46E-04	transcription elongation factor GreA
			NADP-specific glutamate dehydrogenase,				conserved domain protein
SP1306	**1.7**	**3.03E-07**	***gdhA***	*SP1533*	0.8	7.19E-05	
			v-type sodium ATP synthase, subunit D				inorganic pyrophosphatase, manganese-
SP1315	1.3	1.20E-04		*SP1534*	0.8	5.84E-05	dependent, ppaC
SP1378	1.3	7.95E-04	conserved hypothetical protein	*SP1540*	0.8	2.83E-04	single-strand binding protein
SP1380	1.3	2.64E-04	hypothetical protein	*SP1548*	0.7	2.81E-06	hypothetical protein
SP1381	**1.5**	**1.08E-04**	**ABC transporter, ATP-binding protein**	***SP1549***	**0.6**	**1.21E-05**	**polypeptide deformylase, *def*-2**
SP1405	1.4	2.67E-05	conserved hypothetical protein	*SP1574*	0.8	2.65E-04	triosephosphate isomerase
SP1422	1.4	5.19E-04	hypothetical protein	*SP1576*	0.8	6.73E-04	homoserine O-succinyltransferase, *metA*
SP1424	1.4	7.12E-04	hypothetical protein	***SP1578***	**0.6**	**3.23E-04**	**putative methyltransferase**
			peptidoglycan N-acetylglucosamine				**sugar ABC transporter, ATP-binding**
SP1479	1.3	1.71E-04	deacetylase A, *pgdA*	***SP1580***	**0.4**	**8.68E-11**	**protein, *msmK***
SP1529	1.2	5.91E-04	putative polysaccharide biosynthesis protein	*SP1605*	0.7	3.44E-06	ferredoxin
SP1546	**1.7**	**3.42E-07**	**conserved domain protein**	*SP1607*	0.8	7.62E-04	UDP-glucose 4-epimerase, *galE*-1
SP1560	1.4	6.45E-05	conserved hypothetical protein	*SP1644*	0.7	3.68E-04	conserved hypothetical protein
SP1561	**1.5**	**3.64E-06**	**conserved hypothetical protein**	*SP1645*	0.7	2.36E-06	GTP pyrophosphokinase, *relA*
SP1562	1.3	4.88E-04	hypothetical protein	*SP1647*	0.7	6.36E-06	endopeptidase O, pepO
SP1623	1.3	3.01E-04	cation-transporting ATPase, E1-E2 family	*SP1659*	0.8	1.15E-04	isoleucyl-tRNA synthetase, *ileS*
SP1625	1.4	1.83E-04	putative cadmium resistance transporter	*SP1684*	0.7	1.64E-04	PTS system, IIBC components

SP1636	1.4	2.17E-05	Rrf2 family protein	*SP1685*	0.7	4.44E-05	conserved hypothetical protein
			hypothetical protein				**phosphoglycerate dehydrogenase-**
SP1640	**1.6**	**3.03E-06**		***SP1709***	**0.6**	**4.14E-08**	**related protein**
SP1641	1.4	1.02E-04	conserved domain protein	*SP1710*	0.7	4.85E-05	nitroreductase family protein
SP1668	1.4	2.71E-05	hypothetical protein	*SP1711*	0.7	2.38E-06	primosomal protein DnaI
SP1669	1.4	1.46E-05	MutT/nudix family protein	*SP1712*	0.7	5.36E-06	hypothetical protein
			UDP-N-acetylmuramoylalanyl-D-glutamyl-2,6-diaminopimelate--D-alanyl-D-alanyl				conserved hypothetical protein
SP1670	1.4	1.85E-05	ligase, *murF*	*SP1713*	0.7	5.66E-05	
SP1671	**1.5**	**4.46E-06**	**D-alanine--D-alanine ligase, *ddlA***	*SP1716*	0.7	5.18E-05	conserved hypothetical protein
			putative phosphosugar-binding				**ABC transporter, ATP-binding protein**
SP1674	1.3	5.73E-04	transcriptional regulator	***SP1717***	**0.5**	**5.03E-07**	
SP1695	**2.9**	**6.32E-10**	**putative acetyl xylan esterase**	*SP1778*	0.7	5.53E-06	aquaporin
			hypothetical protein				**tryptophan synthase, alpha subunit,**
SP1696	**2.8**	**2.01E-09**		***SP1811***	**0.4**	**4.06E-08**	***trpA***
SP1714	**7.2**	**1.63E-12**	**transcriptional regulator, GntR family**	***SP1812***	**0.5**	**3.48E-06**	**tryptophan synthase, beta subunit, *trpB***
			ABC transporter, ATP-binding protein				**N-(5'-phosphoribosyl)-anthranilate**
SP1715	**11.4**	**3.27E-13**		***SP1813***	**0.6**	**5.79E-06**	**isomerase, *trpF***
			rRNA methyltransferase RsmB				**anthranilate phosphoribosyltransferase,**
SP1734	1.3	3.07E-04		***SP1815***	**0.6**	**3.52E-05**	***trpD***
			conserved hypothetical protein				**anthranilate synthase component II,**
SP1750	1.3	1.31E-04		***SP1816***	**0.5**	**2.01E-06**	***trpG***
SP1752	1.4	1.99E-05	putative mechanosensitive ion channel	***SP1817***	**0.5**	**4.71E-05**	**anthranilate synthase component I, *trpE***
SP1754	1.4	4.47E-05	conserved hypothetical protein	*SP1826*	0.7	2.63E-04	ABC transporter, substrate-binding protein
			putative transcriptional regulator				oligopeptide ABC transporter, ATP-
SP1774	1.4	1.92E-05		*SP1888*	0.8	3.17E-04	binding protein AmiE
			thioredoxin				oligopeptide ABC transporter,
SP1776	**1.5**	**3.63E-04**		*SP1891*	0.7	2.04E-06	oligopeptide-binding protein AmiA
SP1786	**1.5**	**4.65E-06**	**conserved hypothetical protein**	*SP1906*	0.7	2.53E-05	chaperonin, 60 kDa, *groEL*
SP1787	**1.5**	**6.31E-05**	**hypothetical protein**	*SP1907*	0.7	1.46E-04	chaperonin, 10 kDa, *groES*
SP1860	1.4	1.21E-04	choline transporter, *proWX*	*SP1915*	0.7	8.18E-04	hypothetical protein
SP1903	**1.5**	**1.01E-06**	**conserved hypothetical protein**	*SP1928*	0.8	1.94E-04	IS1381, transposase OrfB
SP1923	1.4	1.29E-04	pneumolysin	*SP1942*	0.8	1.45E-04	putative transcriptional regulator
SP1924	1.4	2.47E-04	hypothetical protein	*SP1943*	0.8	1.06E-04	acetyltransferase, GNAT family
			hypothetical protein				DNA-directed RNA polymerase, beta'
SP1925	**1.5**	**2.63E-04**		*SP1960*	0.8	7.84E-05	subunit
			hypothetical protein				DNA-directed RNA polymerase, beta
SP1926	**1.7**	**2.41E-06**		*SP1961*	0.7	2.45E-05	subunit, *rpoB*

			membrane protein				phosphopantetheine adenylyltransferase, *coaD*
SP1972	1.3	6.41E-05		*SP1968*	0.8	4.68E-05	
SP2013	**1.5**	**6.47E-06**	**conserved hypothetical protein**	***SP1970***	**0.3**	**2.32E-11**	**aspartate--ammonia ligase, *asnA***
			nicotinate-nucleotide pyrophosphorylase,				aminotransferase, class I
SP2016	**1.9**	**3.96E-06**	**nadC**	*SP1994*	0.8	4.05E-05	
SP2020	1.3	8.61E-04	transcriptional regulator, GntR family	*SP1997*	0.7	9.73E-06	Cof family protein
SP2106	**3.2**	**6.99E-12**	**glycogen phosphorylase family protein**	***SP2026***	**0.6**	**1.71E-04**	**alcohol dehydrogenase, iron-containing**
SP2107	**3.4**	**1.76E-12**	**4-alpha-glucanotransferase**	*SP2030*	0.7	7.97E-05	transketolase
SP2151	1.3	4.04E-04	carbamate kinase, *arcC*	*SP2040*	0.7	3.72E-05	putative jag protein
SP2152	**1.6**	**1.70E-05**	**conserved hypothetical protein**	*SP2041*	0.7	5.44E-05	SpoIIIJ family protein
SP2173	**1.6**	**8.93E-07**	**dltD protein**	*SP2042*	0.8	4.32E-04	ribonuclease P protein component, *rnpA*
SP2174	**1.6**	**3.60E-05**	**D-alanyl carrier protein, *dltC***	*SP2044*	0.7	8.25E-07	acetate kinase, *ackA*
SP2175	**1.6**	**9.92E-08**	**dltB protein**	*SP2054*	0.7	1.41E-04	conserved hypothetical protein
SP2176	**1.8**	**1.62E-08**	**D-alanine-activating enzyme, *dltA***	*SP2055*	0.7	9.15E-06	alcohol dehydrogenase, zinc-containing
SP2204	1.3	8.76E-04	ribosomal protein L9, *rplI*	***SP2058***	**0.6**	**7.13E-05**	**queuine tRNA-ribosyltransferase**
SP2205	**1.5**	**5.99E-07**	**DHH subfamily 1 protein**	*SP2065*	0.8	1.98E-04	MATE efflux family protein
SP2225	1.2	9.61E-04	conserved hypothetical protein	*SP2069*	0.7	1.39E-05	glutamyl-tRNA synthetase, *gltX*
SP2238	**1.9**	**6.58E-06**	**conserved hypothetical protein**	***SP2078***	**0.6**	**5.79E-08**	**arginyl-tRNA synthetase, *argS***
SP2239	**3.0**	**6.94E-09**	**serine protease**	*SP2081*	0.8	4.71E-05	conserved hypothetical protein
			spspoJ protein				**maltose/maltodextrin ABC transporter,**
SP2240	**3.5**	**1.35E-11**		***SP2108***	**0.6**	**4.15E-07**	***malX***
							maltodextrin ABC transporter,
				SP2109	**0.6**	**7.41E-06**	**permease protein, *malC***
				SP2134	**0.6**	**2.53E-07**	**ribosomal protein L32, *rpmF***
				SP2135	**0.6**	**3.62E-05**	**ribosomal protein L33, *rpmG*-3**
				SP2144	0.7	8.16E-04	conserved hypothetical protein
				SP2185	**0.6**	**2.51E-05**	**hypothetical protein**
				SP2186	**0.5**	**1.45E-06**	**glycerol kinase**
				SP2187	0.8	7.59E-04	conserved domain protein
				SP2188	0.7	3.32E-07	chaperonin, 33 kDa, *hslO*
				SP2189	0.7	4.26E-05	putative TIM-barrel protein, NifR3 family
				SP2214	0.7	1.83E-05	translation elongation factor Ts
				SP2215	0.7	1.91E-05	ribosomal protein S2, *rpsB*
				SP2216	0.7	2.12E-04	secreted 45 kd protein, *usp45*
				SP2218	0.8	8.03E-05	rod shape-determining protein MreC
				SP2230	0.7	7.99E-05	ABC transporter, ATP-binding protein
				SP2233	**0.3**	**1.52E-06**	**hypothetical protein**

1 **F.** List of genes differentially expressed upon **30 min.** treatment with **LL-37**:

up-regulated genes				down-regulated genes			
Gene ID	**Ratio**	**Bayes.p**	**NCBI annotation**	**Gene ID**	**Ratio**	**Bayes.p**	**NCBI annotation**
SP0057	1.4	4.35E-04	beta-N-acetylhexosaminidase	***SP0024***	**0.5**	**3.10E-06**	**Conserved hypothetical protein**
SP0071	**2.2**	**6.27E-05**	**zinc metalloprotease ZmpC**	***SP0025***	**0.6**	**4.78E-05**	**Hypothetical protein**
SP0088	**1.8**	**5.71E-07**	**hypothetical protein**	***SP0026***	**0.5**	**6.92E-05**	**Hypothetical protein**
SP0141	**1.7**	**1.28E-05**	**transcriptional regulator**	***SP0034***	**0.5**	**1.37E-06**	**membrane protein**
SP0143	**1.5**	**3.87E-05**	**conserved domain protein**	***SP0117***	**0.6**	**3.55E-04**	**pneumococcal surface protein A**
SP0144	**1.7**	**1.28E-05**	**hypothetical protein**	*SP0239*	0.7	9.64E-04	conserved hypothetical protein
SP0145	**1.5**	**2.10E-05**	**conserved hypothetical protein**	***SP0281***	**0.5**	**2.60E-06**	**aminopeptidase C, *pepC***
SP0151	1.4	2.06E-04	ABC transporter, ATP-binding protein	***SP0282***	**0.3**	**4.30E-07**	**PTS system, mannose-specific IID component**
SP0157	**2.0**	**1.09E-07**	**hypothetical protein**	***SP0283***	**0.3**	**1.52E-07**	**PTS system, mannose-specific IIC component, *manM***
SP0178	**1.5**	**5.20E-05**	**riboflavin biosynthesis protein RibD**	***SP0284***	**0.2**	**2.54E-08**	**PTS system, mannose-specific IIAB components, *manL***
SP0184	**1.5**	**5.74E-06**	**hypothetical protein**	***SP0285***	**0.6**	**3.24E-05**	**alcohol dehydrogenase, zinc-containing**
SP0185	**1.7**	**2.55E-05**	**magnesium transporter, CorA family**	*SP0286*	0.7	3.40E-04	Cof family protein
SP0189	**1.7**	**1.95E-06**	**conserved hypothetical protein**	***SP0287***	**0.6**	**4.48E-04**	**xanthine/uracil permease family protein**
SP0190	1.4	9.20E-04	hypothetical protein	*SP0289*	0.7	1.69E-04	dihydropteroate synthase
SP0191	1.4	3.22E-04	hypothetical protein	*SP0290*	0.7	2.68E-04	dihydrofolate synthetase, *folC*
SP0196	**1.5**	**5.50E-04**	**hypothetical protein**	*SP0291*	0.7	5.74E-04	GTP cyclohydrolase I, *folE*
SP0197	**1.5**	**6.42E-05**	**putative dihydrofolate synthetase**	*SP0292*	0.7	2.05E-04	bifunctional folate synthesis protein, *sulD*
SP0198	1.3	9.14E-04	hypothetical protein	***SP0293***	**0.6**	**1.28E-05**	**hypothetical protein**
SP0199	**1.5**	**2.01E-04**	**cardiolipin synthetase**	***SP0366***	**0.3**	**1.13E-09**	**oligopeptide ABC transporter oligopeptide-binding protein AliA**
SP0200	**1.6**	**3.40E-06**	**competence-induced protein Ccs4**	***SP0368***	**0.6**	**9.29E-04**	**cell wall surface anchor family protein**
SP0233	**1.5**	**1.27E-04**	**ribosomal protein L36**	***SP0411***	**0.6**	**3.65E-06**	**seryl-tRNA synthetase, *serS***
SP0234	**1.6**	**2.53E-06**	**ribosomal protein S13**	*SP0413*	0.7	1.30E-04	aspartate kinase
SP0235	**1.5**	**1.91E-05**	**ribosomal protein S11**	*SP0435*	0.7	6.22E-04	translation elongation factor P
SP0236	**1.5**	**3.63E-05**	**DNA-directed RNA polymerase, alpha subunit, *rpoA***	***SP0445***	**0.6**	**1.35E-04**	**acetolactate synthase, large subunit, biosynthetic type, i*lvB***
SP0237	**2.9**	**2.30E-07**	**ribosomal protein L17**	***SP0446***	**0.5**	**3.24E-08**	**acetolactate synthase, small subunit, ilvN**
SP0261	**1.7**	**4.50E-06**	**undecaprenyl diphosphate synthase, *uupS***	***SP0447***	**0.5**	**8.68E-08**	**ketol-acid reductoisomerase, *ilvC***

SP0262	**1.7**	**1.25E-06**	**phosphatidate cytidylyltransferase**	***SP0448***	**0.5**	**2.03E-06**	**hypothetical protein**
SP0263	1.4	5.45E-04	eep protein	***SP0449***	**0.6**	**3.22E-04**	**hypothetical protein**
SP0264	1.4	2.97E-04	prolyl-tRNA synthetase, *proS*	*SP0450*	0.7	5.78E-04	threonine dehydratase
SP0275	**1.6**	**1.63E-05**	**conserved hypothetical protein**	*SP0453*	0.7	7.31E-04	amino acid ABC transporter, amino acid-binding protein/permease protein
SP0276	**1.5**	**3.23E-05**	**conserved hypothetical protein**	***SP0479***	**0.6**	**1.71E-05**	**potassium uptake protein, Trk family**
SP0277	**1.5**	**1.06E-04**	**hypothetical protein**	*SP0480*	0.7	2.77E-04	potassium uptake protein, Trk family
SP0278	1.4	7.66E-04	aminopeptidase PepS	***SP0516***	**0.6**	**3.04E-04**	**heat shock protein GrpE**
SP0331	**1.9**	**3.81E-05**	**hypothetical protein; this gene contains a frame shift**	***SP0517***	**0.5**	**6.00E-07**	**DnaK protein**
SP0333	**1.7**	**1.39E-05**	**putative transcriptional regulator**	***SP0518***	**0.6**	**9.03E-06**	**hypothetical protein**
SP0346	**1.5**	**5.64E-05**	**capsular polysaccharide biosynthesis protein Cps4A**	***SP0519***	**0.6**	**2.86E-05**	**dnaJ protein**
SP0347	**1.7**	**2.49E-05**	**capsular polysaccharide biosynthesis protein Cps4B**	***SP0565***	**0.6**	**2.38E-05**	**conserved domain protein**
SP0369	**2.2**	**2.47E-06**	**penicillin-binding protein 1A, *pbp1A***	***SP0566***	**0.6**	**1.57E-04**	**acetyltransferase, GNAT family**
SP0370	**2.2**	**4.25E-06**	**recombination protein U, *recU***	***SP0568***	**0.6**	**9.92E-06**	**valyl-tRNA synthetase, *valS***
SP0371	1.4	5.28E-04	conserved hypothetical protein	***SP0577***	**0.2**	**1.43E-11**	**PTS system, beta-glucosides-specific IIABC**
SP0372	**1.5**	**1.56E-05**	**conserved hypothetical protein**	***SP0578***	**0.2**	**1.12E-11**	**6-phospho-beta-glucosidase, *bglA*-2**
SP0385	**1.6**	**2.34E-04**	**conserved hypothetical protein**	***SP0579***	**0.5**	**1.22E-07**	**phenylalanyl-tRNA synthetase, alpha subunit, *pheS***
SP0386	**1.7**	**1.06E-04**	**putative sensor histidine kinase**	***SP0580***	**0.5**	**1.91E-06**	**acetyltransferase, GNAT family**
SP0387	**1.5**	**3.08E-04**	**DNA-binding response regulator**	***SP0581***	**0.5**	**9.45E-07**	**phenylalanyl-tRNA synthetase, beta subunit**
SP0402	**1.5**	**1.30E-04**	**signal peptidase I**	***SP0605***	**0.6**	**1.76E-04**	**fructose-bisphosphate aldolase**
SP0403	**1.5**	**2.85E-05**	**ribonuclease HIII, *rnhC***	*SP0615*	0.7	1.59E-04	beta-lactam resistance factor, *fibA*
SP0404	**1.6**	**1.74E-04**	**hypothetical protein**	*SP0616*	0.7	1.35E-04	beta-lactam resistance factor, *fibB*
SP0405	**1.6**	**1.26E-04**	**conserved hypothetical protein**	***SP0730***	**0.5**	**3.64E-06**	**pyruvate oxidase, *spxB***
SP0408	**2.1**	**2.38E-05**	**sodium:alanine symporter family protein**	***SP0731***	**0.6**	**2.07E-06**	**conserved domain protein**
SP0409	**1.5**	**3.01E-04**	**conserved hypothetical protein**	*SP0770*	0.7	6.53E-04	ABC transporter, ATP-binding protein
SP0415	**1.9**	**1.27E-06**	**enoyl-CoA hydratase/isomerase family protein**	***SP0771***	**0.6**	**2.78E-05**	**peptidyl-prolyl cis-trans isomerase, cyclophilin-type**
SP0416	**1.6**	**2.11E-06**	**transcriptional regulator, MarR family**	***SP0775***	**0.6**	**5.04E-05**	**ribosomal protein S16, *rpsP***
SP0417	**1.8**	**6.64E-07**	**3-oxoacyl-(acyl-carrier-protein) synthase III, *fabH***	***SP0845***	**0.4**	**4.40E-06**	**lipoprotein**
SP0419	**1.8**	**9.50E-07**	**enoyl-(acyl-carrier-protein) reductase,**	*SP0856*	0.7	1.12E-04	branched-chain amino acid

			fabK				aminotransferase, *ilvE*
			malonyl CoA-acyl carrier protein				**putative membrane protein**
SP0420	**1.6**	**1.30E-05**	**transacylase, *fabD***	***SP0857***	**0.6**	**7.10E-04**	
			3-oxoacyl-[acyl-carrier protein]				**membrane protein**
SP0421	**1.6**	**3.38E-05**	**reductase, *fabG***	***SP0858***	**0.6**	**2.95E-04**	
			3-oxoacyl-(acyl-carrier-protein) synthase II,				ribosomal protein S1, *rpsA*
SP0422	1.4	1.12E-04	*fabF*	*SP0862*	0.7	5.33E-04	
			acetyl-CoA carboxylase, bitoin carboxyl				**putative type I restriction-modification**
SP0423	**1.5**	**5.41E-05**	**carrier protein, *accB***	***SP0887***	**0.6**	**1.29E-05**	**system, S subunit**
			(3R)-hydroxymyristoyl-(acyl-carrier-				**conserved hypothetical protein**
SP0424	**1.6**	**1.45E-05**	**protein) dehydratase, *fabZ***	***SP1004***	**0.6**	**1.24E-04**	
			acetyl-CoA carboxylase, biotin				**peptidase t, *pepT***
SP0425	**1.6**	**1.07E-05**	**carboxylase. *accC***	***SP1008***	**0.6**	**9.34E-06**	
			acetyl-CoA carboxylase, carboxyl				aspartate-semialdehyde dehydrogenase
SP0426	**1.6**	**1.69E-05**	**transferase, beta subunit, *accD***	*SP1013*	0.7	1.24E-04	
			acetyl-CoA carboxylase, carboxyl				**iron-compound ABC transporter, iron**
SP0427	**2.1**	**8.26E-07**	**transferase, alpha subunit, *accA***	***SP1032***	**0.6**	**3.24E-05**	**compound-binding protein**
			hypothetical protein				iron-compound ABC transporter, permease
SP0429	**1.7**	**1.36E-04**		*SP1034*	0.7	4.24E-04	protein
			hypothetical protein				**iron-compound ABC transporter, ATP-**
SP0430	**1.9**	**3.87E-05**		***SP1035***	**0.6**	**7.60E-04**	**binding protein**
SP0431	**1.6**	**2.66E-04**	**conserved domain protein**	***SP1069***	**0.6**	**1.68E-04**	**conserved hypothetical protein**
SP0484	1.4	1.15E-04	cobalt transport protein	***SP1070***	**0.6**	**4.65E-05**	**conserved hypothetical protein**
SP0489	**1.5**	**6.77E-05**	**PAP2 family protein**	***SP1089***	**0.6**	**2.59E-06**	**glutamine amidotransferase, class I**
SP0490	**1.5**	**2.02E-04**	**hypothetical protein**	***SP1090***	**0.6**	**1.47E-06**	**conserved hypothetical protein**
SP0491	**1.5**	**7.54E-04**	**hypothetical protein**	*SP1114*	0.7	2.72E-04	ABC transporter, ATP-binding protein
			conserved domain protein				**glyceraldehyde-3-phosphate**
SP0492	**1.6**	**4.95E-05**		***SP1119***	**0.5**	**1.76E-05**	**dehydrogenase, NADP-dependent**
SP0496	**1.6**	**8.35E-05**	**Na/Pi cotransporter II-related protein**	***SP1128***	**0.6**	**3.75E-04**	**enolase**
			transcriptional regulator, MerR family				dihydroorotase, multifunctional complex
SP0501	**2.1**	**1.77E-05**		*SP1167*	0.7	8.55E-04	type, *pyrC*
SP0502	**2.1**	**4.40E-06**	**glutamine synthetase, type I**	***SP1170***	**0.5**	**6.74E-06**	**hypothetical protein**
			hypothetical protein				**hydrolase, haloacid dehalogenase-like**
SP0503	**1.7**	**9.69E-04**		***SP1171***	**0.5**	**1.20E-06**	**family**
SP0504	**2.0**	**2.41E-06**	**hypothetical protein**	***SP1175***	**0.5**	**2.17E-07**	**conserved domain protein**
			BlpT protein, fusion				lactose phosphotransferase system
SP0524	**1.8**	**1.33E-05**		*SP1182*	0.7	6.59E-06	repressor, *lacR*-2
SP0525	**1.8**	**2.25E-06**	**BlpS protein**	***SP1185***	**0.6**	**1.87E-05**	**PTS system, lactose-specific IIBC**

							components, *lacE*-2
SP0526	**1.6**	**2.50E-06**	**response regulator BlpR**	***SP1187***	**0.5**	**2.70E-06**	**transcription antiterminator LacT**
SP0527	**1.8**	**2.47E-05**	**putative sensor histidine kinase BlpH**	*SP1190*	0.7	4.65E-04	tagatose 1,6-diphosphate aldolase, *lacD*
SP0528	**1.8**	**2.75E-04**	**peptide pheromone BlpC**	*SP1191*	0.7	7.67E-04	tagatose-6-phosphate kinase, *lacC*
			BlpB ABC transporter				galactose-6-phosphate isomerase, LacA
SP0529	**2.2**	**5.50E-09**		*SP1193*	0.7	6.94E-04	subunit, *lacA*
SP0530	**3.6**	**2.25E-09**	**BlpA ABC transporter**	***SP1212***	**0.6**	**1.02E-04**	**tRNA pseudouridine synthase B, *truB***
SP0533	**1.5**	**1.50E-05**	**bacteriocin BlpK**	***SP1294***	**0.6**	**8.02E-04**	**crcB protein, *crcB*-1**
SP0545	**5.9**	**2.80E-11**	**immunity protein BlpY**	***SP1295***	**0.6**	**1.29E-05**	**crcB protein, *crcB*-2**
SP0546	**3.8**	**4.27E-10**	**BlpZ protein, fusion**	***SP1298***	**0.5**	**2.36E-08**	**DHH subfamily 1 protein**
SP0547	**4.0**	**1.87E-08**	**conserved domain protein**	*SP1383*	0.7	1.41E-04	alanyl-tRNA synthetase, *alaS*
SP0557	**1.8**	**5.88E-05**	**ribosome-binding factor A, *rbfA***	*SP1384*	0.7	6.11E-04	conserved hypothetical protein
			hypothetical protein				This gene is interrupted by an RUP
SP0582	**2.2**	**6.33E-06**		*SP1441*	0.7	9.41E-04	element
SP0589	1.3	8.94E-04	serine acetyltransferase, *cysE*	***SP1445***	**0.3**	**5.03E-10**	**GMP synthase, *guaA***
SP0592	**1.5**	**1.80E-05**	**conserved hypothetical protein**	***SP1462***	**0.6**	**1.28E-05**	**conserved hypothetical protein**
			leucine-rich protein				**methylated-DNA--protein-cysteine S-**
SP0593	**1.6**	**7.21E-06**		***SP1463***	**0.5**	**1.08E-06**	**methyltransferase**
SP0617	**1.5**	**1.40E-04**	**conserved domain protein**	***SP1464***	**0.6**	**1.40E-06**	**acetyltransferase, GNAT family**
SP0641	**1.5**	**7.95E-04**	**serine protease, subtilase family**	*SP1469*	0.7	5.52E-04	NADH oxidase
			transporter, monovalent cation:proton				glycyl-tRNA synthetase, beta subunit, *glyS*
SP0655	1.3	4.70E-04	antiporter-2 (CPA2) family	*SP1474*	0.7	2.15E-04	
SP0656	1.3	2.36E-04	putative ribonuclease BN	*SP1491*	0.7	3.12E-04	putative glycerol uptake facilitator protein
			cytochrome c-type biogenesis protein CcdA				**amino acid ABC transporter, amino**
SP0657	1.4	4.65E-05		***SP1500***	**0.5**	**6.35E-06**	**acid-binding protein**
			conserved hypothetical protein				amino acid ABC transporter, ATP-binding
SP0742	**1.8**	**5.88E-05**		*SP1501*	0.7	1.25E-05	protein
			conserved hypothetical protein				amino acid ABC transporter, permease
SP0748	1.4	3.92E-04		*SP1502*	0.7	6.27E-05	protein
SP0762	**1.7**	**3.31E-06**	**S-adenosylmethionine synthetase**	*SP1505*	0.7	5.63E-04	membrane protein
SP0783	**2.3**	**8.25E-07**	**conserved hypothetical protein**	*SP1508*	0.7	3.00E-04	ATP synthase F1, beta subunit, *atpD*
SP0785	**5.5**	**3.64E-12**	**conserved hypothetical protein**	***SP1509***	**0.6**	**7.45E-07**	**ATP synthase F1, gamma subunit, *atpG***
SP0786	**5.0**	**1.34E-07**	**ABC transporter, ATP-binding protein**	***SP1510***	**0.6**	**2.31E-06**	**ATP synthase F1, alpha subunit, *atpA***
SP0787	**6.1**	**1.14E-09**	**conserved hypothetical protein**	***SP1511***	**0.6**	**1.74E-04**	**ATP synthase F1, delta subunit, *atpH***
SP0789	**1.6**	**1.94E-05**	**conserved hypothetical protein**	***SP1512***	**0.6**	**2.83E-05**	**ATP synthase F0, B subunit, *atpF***
SP0790	**1.5**	**1.25E-05**	**conserved hypothetical protein**	***SP1513***	**0.6**	**5.47E-06**	**ATP synthase F0, A subunit, *atpB***
SP0798	**2.1**	**2.78E-04**	**DNA-binding response regulator CiaR**	*SP1533*	0.7	1.99E-04	conserved domain protein

SP0800	**2.1**	**8.88E-06**	**sensor histidine kinase CiaH**	***SP1548***	**0.6**	**6.34E-06**	**hypothetical protein**
SP0805	1.3	3.75E-04	hydrolase, haloacid dehalogenase-like family	***SP1549***	**0.6**	**1.32E-04**	**polypeptide deformylase, *def*-2**
SP0827	1.3	4.52E-04	conserved hypothetical protein, authentic point mutation	***SP1573***	**0.6**	**2.78E-05**	**Lysozyme, *lytC***
SP0829	**1.5**	**6.63E-05**	**Phosphopentomutase, *deoB***	*SP1574*	0.7	4.02E-04	triosephosphate isomerase
SP0838	**1.5**	**1.25E-04**	**ribosomal protein S20, *rpsT***	***SP1580***	**0.5**	**1.18E-07**	**sugar ABC transporter, ATP-binding protein, *msmK***
SP0851	1.4	7.64E-04	conserved hypothetical protein	*SP1604*	0.7	3.23E-04	hypothetical protein
SP0875	**2.2**	**6.03E-07**	**lactose phosphotransferase system repressor**	***SP1605***	**0.6**	**2.95E-06**	**ferredoxin**
SP0876	**2.2**	**8.37E-07**	**putative 1-phosphofructokinase**	***SP1606***	**0.6**	**1.47E-06**	**glycosyl transferase, family 2**
SP0877	**2.3**	**4.79E-07**	**PTS system, fructose specific IIABC components**	***SP1607***	**0.6**	**1.14E-05**	**UDP-glucose 4-epimerase, *galE*-1**
SP0878	**1.6**	**8.50E-05**	**SpoE family protein**	*SP1630*	0.7	2.24E-04	hypothetical protein
SP0880	**1.6**	**1.90E-06**	**aminotransferase, class-V**	***SP1631***	**0.6**	**1.22E-05**	**threonyl-tRNA synthetase**
SP0881	**1.7**	**2.87E-06**	**thiazole biosynthesis protein ThiI**	*SP1645*	0.7	6.61E-04	GTP pyrophosphokinase
SP0895	**1.5**	**3.44E-05**	**DNA polymerase III, alpha subunit, dnaE**	***SP1647***	**0.5**	**4.45E-08**	**endopeptidase O, *pepO***
SP0904	1.3	5.93E-04	conserved hypothetical protein	***SP1651***	**0.5**	**6.17E-07**	**thiol peroxidase, *psaD***
SP0913	**1.8**	**3.15E-04**	**putative ABC transporter, permease protein**	***SP1659***	**0.6**	**1.93E-05**	**isoleucyl-tRNA synthetase, *ileS***
SP0925	1.4	9.27E-04	conserved hypothetical protein	***SP1709***	**0.5**	**1.27E-06**	**phosphoglycerate dehydrogenase-related protein**
SP0931	**1.6**	**3.87E-06**	**glutamate 5-kinase, *proB***	*SP1710*	0.7	9.46E-04	nitroreductase family protein
SP0932	1.3	4.32E-04	gamma-glutamyl phosphate reductase	*SP1711*	0.7	4.47E-04	primosomal protein DnaI
SP0956	**1.7**	**3.30E-05**	**hypothetical protein**	*SP1712*	0.7	4.64E-04	hypothetical protein
SP0957	**2.2**	**2.63E-07**	**ABC transporter, ATP-binding protein**	***SP1717***	**0.6**	**8.93E-05**	**ABC transporter, ATP-binding protein**
SP0958	**2.2**	**2.47E-08**	**hypothetical protein**	***SP1811***	**0.4**	**6.87E-04**	**tryptophan synthase, alpha subunit, *trpA***
SP0974	1.4	7.44E-04	putative preprotein translocase, SecG subunit	***SP1812***	**0.5**	**6.23E-04**	**tryptophan synthase, beta subunit, *trpB***
SP0975	**1.7**	**5.41E-07**	**exoribonuclease, VacB/Rnb family**	***SP1813***	**0.5**	**3.11E-05**	**N-(5'-phosphoribosyl)-anthranilate isomerase, *trpF***
SP0976	**1.7**	**7.57E-06**	**SsrA-binding protein**	***SP1815***	**0.4**	**1.15E-06**	**anthranilate phosphoribosyltransferase, *trpD***
SP0977	**1.7**	**2.67E-06**	**tellurite resistance protein TehB**	***SP1816***	**0.4**	**5.54E-06**	**anthranilate synthase component II, *trpG***
SP1027	**2.7**	**2.18E-06**	**conserved hypothetical protein**	***SP1817***	**0.5**	**3.77E-04**	**anthranilate synthase component I, *trpE***

			putative hydrolase				oligopeptide ABC transporter, ATP-binding protein AmiE
SP1044	**1.9**	**2.31E-06**		*SP1888*	0.7	2.08E-04	
			DNA primase, *dnaG*				oligopeptide ABC transporter, permease protein AmiD
SP1072	1.3	4.27E-04		*SP1889*	0.7	3.30E-04	
			glycosyl transferase CpoA				**oligopeptide ABC transporter, oligopeptide-binding protein AmiA**
SP1075	**1.7**	**2.77E-05**		***SP1891***	**0.6**	**3.50E-05**	
SP1076	**1.6**	**3.59E-05**	**glycosyl transferase, group 1**	***SP1906***	**0.6**	**1.82E-04**	**chaperonin, 60 kDa, *groEL***
SP1077	**1.5**	**9.44E-06**	**conserved domain protein**	***SP1907***	**0.6**	**8.24E-05**	**chaperonin, 10 kDa, *groES***
			hypothetical protein				phosphopantetheine adenylyltransferase, *coaD*
SP1093	1.4	2.00E-04		*SP1968*	0.7	8.07E-04	
			integrase/recombinase, phage integrase family, truncation				**aspartate--ammonia ligase, *asnA***
SP1147	**1.5**	**4.36E-04**		***SP1970***	**0.4**	**2.49E-07**	
SP1148	**1.8**	**2.40E-07**	**IS630-Spn1, transposase Orf2**	***SP1994***	**0.6**	**2.13E-04**	**aminotransferase, class I**
SP1149	**1.8**	**2.48E-06**	**IS630-Spn1, transposase Orf1**	***SP1997***	**0.6**	**2.44E-04**	**Cof family protein**
SP1151	**1.6**	**4.87E-05**	**exonuclease RexB**	***SP2026***	**0.4**	**9.86E-08**	**alcohol dehydrogenase, iron-containing**
SP1152	1.4	4.55E-04	exonuclease RexA	***SP2027***	**0.6**	**1.29E-04**	**conserved hypothetical protein**
SP1153	1.4	4.41E-04	hypothetical protein	*SP2028*	0.7	4.73E-04	phosphotyrosine protein phosphatase
			putative acetoin dehydrogenase complex, E2 component, dihydrolipoamide				**transketolase**
SP1162	**1.5**	**2.79E-04**	**acetyltransferase**	***SP2030***	**0.5**	**1.84E-04**	
			exodeoxyribonuclease VII, large subunit,				**acetate kinase**
SP1207	1.4	7.39E-05	xseA	***SP2044***	**0.6**	**2.78E-04**	
SP1208	1.4	1.92E-04	uridine kinase	*SP2058*	0.7	6.27E-04	queuine tRNA-ribosyltransferase
SP1233	**1.5**	**9.59E-05**	**hypothetical protein**	***SP2069***	**0.6**	**7.74E-05**	**glutamyl-tRNA synthetase, *gltX***
			transcriptional regulator, biotin repressor				**arginyl-tRNA synthetase, *argS***
SP1234	**1.7**	**3.31E-05**	**family**	***SP2078***	**0.6**	**1.22E-05**	
SP1240	**1.7**	**9.20E-06**	**conserved hypothetical protein**	*SP2081*	0.7	8.95E-04	conserved hypothetical protein
			amino acid ABC transporter, amino acid-				maltodextrin ABC transporter, permease
SP1241	**1.6**	**8.32E-05**	**binding protein/permease protein**	*SP2109*	0.7	9.53E-04	protein, *malC*
			amino acid ABC transporter, ATP-				ribosomal protein L32, *rpmF*
SP1242	**1.8**	**5.22E-06**	**binding protein**	*SP2134*	0.7	7.36E-04	
			carbamoyl-phosphate synthase, large				**chaperonin, 33 kDa, *hslO***
SP1275	**2.1**	**7.36E-06**	**subunit *carB***	***SP2188***	**0.6**	**4.64E-05**	
			carbamoyl-phosphate synthase, small				**putative TIM-barrel protein, NifR3**
SP1276	**1.9**	**1.06E-05**	**subunit, *carA***	***SP2189***	**0.6**	**8.60E-05**	**family**
SP1277	**1.7**	**1.76E-04**	**aspartate carbamoyltransferase, *pyrB***	***SP2230***	**0.6**	**1.08E-04**	**ABC transporter, ATP-binding protein**
			v-type sodium ATP synthase, subunit D,				**putative ABC transporter, permease**
SP1315	**1.5**	**4.95E-05**	***ntpD***	***SP2231***	**0.5**	**2.04E-06**	**protein**

			hypothetical protein				**nserved hypothetical protein, authentic**
SP1380	**1.6**	**2.61E-05**		***SP2232***	**0.4**	**6.15E-05**	**frame shift**
SP1381	**1.6**	**7.21E-05**	**ABC transporter, ATP-binding protein**	***SP2233***	**0.3**	**1.47E-06**	**hypothetical protein**
			spermidine/putrescine ABC transporter,				**transcriptional regulator, TetR family**
SP1388	1.3	6.66E-04	permease protein	***SP2234***	**0.5**	**3.09E-05**	
			UDP-N-acetylenolpyruvoylglucosamine				response regulator ComE
SP1390	1.3	4.62E-04	reductase, *murB*	*SP2235*	0.7	7.63E-04	
SP1392	1.3	8.55E-04	alpha-acetolactate decarboxylase, *aldB*				
SP1405	**1.5**	**1.24E-05**	**conserved hypothetical protein**				
SP1426	1.4	3.94E-04	ABC transporter, ATP-binding protein				
			peptidoglycan N-acetylglucosamine				
SP1479	1.4	9.25E-04	deacetylase A, *pgdA*				
			UDP-N-acetylmuramate--alanine ligase,				
SP1521	**1.5**	**7.17E-04**	**murC**				
SP1522	1.4	4.23E-04	conserved domain protein				
SP1523	1.4	7.00E-04	Snf2 family protein				
SP1546	**1.7**	**1.71E-05**	**conserved domain protein**				
SP1560	**1.5**	**1.62E-05**	**conserved hypothetical protein**				
SP1561	**1.6**	**6.49E-06**	**conserved hypothetical protein**				
SP1562	**1.6**	**4.26E-06**	**hypothetical protein**				
SP1600	**1.7**	**8.74E-06**	**putative membrane protein**				
SP1602	**1.4**	**4.80E-04**	**phnA protein**				
SP1623	**1.7**	**4.43E-06**	**cation-transporting ATPase, E1-E2 family**				
SP1625	1.4	9.69E-04	putative cadmium resistance transporter				
SP1636	1.4	2.71E-04	Rrf2 family protein				
SP1640	**1.6**	**2.09E-06**	**hypothetical protein**				
SP1641	**1.6**	**2.22E-05**	**Conserved hypothetical protein**				
SP1668	**1.6**	**4.06E-05**	**hypothetical protein**				
SP1669	1.3	3.04E-04	MutT/nudix family protein				
			UDP-N-acetylmuramoylalanyl-D-glutamyl-2, 6-diaminopimelate--D-alanyl-D-alanyl				
SP1670	1.3	8.29E-04	ligase, *murF*				
SP1671	1.4	3.06E-04	D-alanine--D-alanine ligase, *ddlA*				
			putative phosphosugar-binding				
SP1674	**1.6**	**2.42E-06**	**transcriptional regulator**				
SP1695	**2.3**	**6.74E-05**	**putative acetyl xylan esterase**				
SP1696	**2.5**	**3.28E-05**	**hypothetical protein**				

SP1714	**9.1**	**9.49E-14**	**transcriptional regulator, GntR family**				
SP1715	**13.0**	**2.33E-15**	**ABC transporter, ATP-binding protein**				
SP1720	1.3	9.91E-04	conserved hypothetical protein				
SP1752	1.4	3.56E-04	putative mechanosensitive ion channel				
SP1774	**1.6**	**1.44E-06**	**putative transcriptional regulator**				
SP1776	**1.5**	**3.55E-05**	**thioredoxin**				
SP1786	**1.9**	**7.55E-07**	**conserved hypothetical protein**				
SP1787	**1.8**	**3.07E-07**	**hypothetical protein**				
SP1860	**1.8**	**2.85E-07**	**choline transporter, *proWX***				
SP1861	**1.7**	**1.96E-06**	**choline transporter, *proV***				
SP1862	**1.5**	**1.02E-04**	**hypothetical protein**				
SP1863	**1.5**	**1.18E-05**	**transcriptional regulator, MarR family**				
SP1903	**1.6**	**3.27E-05**	**conserved hypothetical protein**				
SP1926	**1.5**	**3.74E-05**	**hypothetical protein**				
SP1938	**1.6**	**4.12E-04**	**hypothetical protein**				
SP1939	**1.5**	**5.01E-05**	**MATE efflux family protein DinF**				
SP1972	1.4	5.69E-04	membrane protein				
SP2007	**1.5**	**5.76E-04**	**transcription antitermination protein NusG**				
SP2009	**1.5**	**6.82E-05**	**ribosomal protein L33, *rpmG*-2**				
SP2013	**1.9**	**4.11E-08**	**conserved hypothetical protein**				
SP2016	**2.0**	**3.92E-07**	**nicotinate-nucleotide pyrophosphorylase, *nadC***				
SP2062	**1.5**	**4.84E-04**	**transcriptional regulator, MarR family**				
SP2106	**2.6**	**4.50E-06**	**glycogen phosphorylase family protein**				
SP2107	**2.9**	**5.56E-06**	**4-alpha-glucanotransferase, *malQ***				
SP2148	**1.5**	**4.07E-06**	**arginine deiminase, *arcA***				
SP2150	1.4	9.24E-05	ornithine carbamoyltransferase, *argF*				
SP2151	**1.6**	**2.33E-06**	**carbamate kinase, *arcC***				
SP2152	**1.9**	**2.88E-07**	**conserved hypothetical protein**				
SP2153	**1.5**	**1.51E-04**	**peptidase, M20/M25/M40 family**				
SP2202	**1.6**	**7.03E-05**	**conserved hypothetical protein**				
SP2205	**1.5**	**2.67E-05**	**DHH subfamily 1 protein**				
SP2226	1.3	8.27E-04	conserved hypothetical protein				
SP2239	**2.3**	**8.74E-05**	**serine protease**				
SP2240	**2.2**	**7.51E-04**	**spspoJ protein**				

Table S.2. List of genes commonly up- and down-regulated upon **15 and 30** min.

A : treatment with each AMP:

Bacitracin	**Nisin**	**LL-37**					
SP0430	*SP0415*	*SP0071*	*SP0447*	*SP0787*	*SP1193*	*SP1695*	*SP2188*
SP0785	*SP0501*	*SP0024*	*SP0448*	*SP0789*	*SP1212*	*SP1696*	*SP2189*
SP0786	*SP0502*	*SP0025*	*SP0450*	*SP0790*	*SP1241*	*SP1709*	*SP2205*
SP0787	*SP0876*	*SP0026*	*SP0479*	*SP0798*	*SP1242*	*SP1710*	*SP2230*
SP0910	*SP0875*	*SP0034*	*SP0496*	*SP0800*	*SP1380*	*SP1711*	*SP2233*
SP0912	*SP0912*	*SP0088*	*SP0501*	*SP0805*	*SP1381*	*SP1712*	*SP2239*
SP0913	*SP0913*	*SP0117*	*SP0502*	*SP0829*	*SP1383*	*SP1714*	*SP2240*
SP1480	*SP1241*	*SP0157*	*SP0503*	*SP0845*	*SP1405*	*SP1715*	
SP2086	*SP1242*	*SP0185*	*SP0504*	*SP0851*	*SP1445*	*SP1717*	
	SP1588	*SP0197*	*SP0516*	*SP0875*	*SP1462*	*SP1752*	
	SP1648	*SP0200*	*SP0517*	*SP0876*	*SP1463*	*SP1774*	
	SP1649	*SP0234*	*SP0518*	*SP0877*	*SP1464*	*SP1776*	
	SP1871	*SP0237*	*SP0519*	*SP0878*	*SP1469*	*SP1786*	
	SP1872	*SP0239*	*SP0524*	*SP0887*	*SP1479*	*SP1787*	
		SP0261	*SP0525*	*SP0895*	*SP1491*	*SP1811*	
		SP0281	*SP0526*	*SP0904*	*SP1500*	*SP1812*	
		SP0282	*SP0527*	*SP0913*	*SP1508*	*SP1813*	
		SP0283	*SP0529*	*SP0925*	*SP1509*	*SP1815*	
		SP0284	*SP0530*	*SP0956*	*SP1510*	*SP1816*	
		SP0285	*SP0533*	*SP0957*	*SP1511*	*SP1817*	
		SP0287	*SP0545*	*SP0958*	*SP1512*	*SP1860*	
		SP0289	*SP0546*	*SP0974*	*SP1513*	*SP1888*	

		SP0290	*SP0547*	*SP0975*	*SP1533*	*SP1891*
		SP0291	*SP0557*	*SP0976*	*SP1546*	*SP1903*
		SP0292	*SP0565*	*SP0977*	*SP1548*	*SP1906*
		SP0293	*SP0566*	*SP1013*	*SP1549*	*SP1907*
		SP0366	*SP0568*	*SP1027*	*SP1560*	*SP1926*
		SP0369	*SP0577*	*SP1032*	*SP1561*	*SP1968*
		SP0370	*SP0578*	*SP1034*	*SP1562*	*SP1970*
		SP0372	*SP0579*	*SP1035*	*SP1574*	*SP1972*
		SP0385	*SP0581*	*SP1069*	*SP1580*	*SP1997*
		SP0386	*SP0582*	*SP1070*	*SP1605*	*SP2013*
		SP0402	*SP0589*	*SP1075*	*SP1607*	*SP2016*
		SP0403	*SP0592*	*SP1076*	*SP1623*	*SP2026*
		SP0404	*SP0593*	*SP1077*	*SP1625*	*SP2030*
		SP0405	*SP0617*	*SP1093*	*SP1636*	*SP2044*
		SP0408	*SP0730*	*SP1148*	*SP1640*	*SP2058*
		SP0413	*SP0731*	*SP1149*	*SP1641*	*SP2069*
		SP0415	*SP0742*	*SP1151*	*SP1645*	*SP2078*
		SP0416	*SP0748*	*SP1162*	*SP1647*	*SP2081*
		SP0417	*SP0762*	*SP1171*	*SP1659*	*SP2106*
		SP0419	*SP0770*	*SP1175*	*SP1668*	*SP2107*
		SP0424	*SP0775*	*SP1185*	*SP1669*	*SP2109*
		SP0427	*SP0783*	*SP1187*	*SP1670*	*SP2134*
		SP0445	*SP0785*	*SP1190*	*SP1671*	*SP2151*
		SP0446	*SP0786*	*SP1191*	*SP1674*	*SP2152*

B List of genes commonly regulated upon **15 and 30** min. treatment with:

Nisin and LL-37	**Bacitracin and LL-37**	**Bacitracin and nisin**	**Bacitracin, nisin and LL-37**
SP0415	*SP0785*	*SP0912*	*SP0913*

SP0875	*SP0786*		
SP0876	*SP0787*		
SP0501			
SP0502			
SP1241			
SP1242			

Table S.3. List of genes whose expression changed significantly in more than 1 stress and depicted in FIG. 1.

A. List of genes commonly **down-regulated** after 15 or 30 min. upon treatment with:

nisin and LL-37	**bacitracin and LL-37**
SP0285	*SP0117*
SP0366	*SP0281*
SP0578	*SP0285*
SP0577	*SP0366*
SP0731	*SP0435*
SP0922	*SP0453*
SP1187	*SP0516*
SP1507	*SP0565*
SP1970	*SP0566*
SP2055	*SP0568*
SP2108	*SP0577*
	SP0579
	SP0580
	SP0581
	SP0731
	SP0770
	SP0775
	SP1175

	SP1383
	SP1384
	SP1441
	SP1474
	SP1533
	SP1630
	SP1631
	SP1651
	SP1659
	SP1906
	SP2026
	SP2134
	SP2188
	SP2189

B. List of genes commonly **up-regulated** upon 15 min. treatment with:

bacitracin and LL-37	**nisin and LL-37**	**nisin and bacitracin**	**bacitracin, nisin and LL-37**
SP0385	*SP0185*	*SP0912*	*SP0913*
SP0386	*SP0415*		
SP0419	*SP0416*		
SP0424	*SP0851*		
SP0427	*SP0875*		
SP0785	*SP0876*		
SP0786	*SP2173*		
SP0787			
SP0861			
SP0910			
SP1714			
SP1715			
SP1925			

SP1926			

C. List of genes commonly **up-regulated** upon 30 min. treatment with:

bacitracin and LL-37	**nisin and LL-37**	**bacitracin and nisin**	**bacitracin, nisin and LL-37**
SP0088	*SP0415*	*SP0912*	*SP0875*
SP0157	*SP0419*	*SP0913*	*SP0876*
SP0189	*SP0422*		*SP0913*
SP0275			*SP2062*
SP0276			
SP0278			
SP0369			
SP0370			
SP0371			
SP0408			
SP0582			
SP0641			
SP0785			
SP0786			
SP0787			
SP0790			
SP0800			
SP0877			
SP1148			
SP1674			
SP1774			
SP1786			
SP1787			

Table S.4. List of genes differentially regulated by more than one AMP at either time point

A. List of genes induced upon **15 or 30** min. treatment with:

Bacitracin, nisin and LL-37	**Bacitracin and LL-37**	**Bacitracin and nisin**	**Nisin and LL-37**
SP0419	*SP0088*	*SP0912*	*SP0185*
SP0422	*SP0157*	*SP1343*	*SP0415*
SP0641	*SP0189*	*SP1588*	*SP0416*
SP0875	*SP0275*	*SP2063*	*SP0851*
SP0876	*SP0276*		*SP2173*
SP0913	*SP0278*		
SP2062	*SP0369*		
	SP0370		
	SP0371		
	SP0385		
	SP0386		
	SP0387		
	SP0408		
	SP0420		
	SP0421		
	SP0424		
	SP0426		
	SP0427		
	SP0430		
	SP0582		
	SP0785		
	SP0786		
	SP0787		

	SP0790		
	SP0800		
	SP0861		
	SP0877		
	SP0910		
	SP1148		
	SP1674		
	SP1714		
	SP1715		
	SP1774		
	SP1786		
	SP1787		
	SP1925		
	SP1926		

B. List of genes commonly down-regulated upon **15 or 30** min. treatment with:

Bacitracin, nisin and LL-37	**Nisin and LL-37**	**Bacitracin and LL-37**
SP0285	*SP0578*	*SP0117*
SP0366	*SP1187*	*SP0281*
SP0731	*SP1295*	*SP0435*
SP0922	*SP1507*	*SP0453*
SP2055	*SP1970*	*SP0459*
	SP2108	*SP0516*
		SP0565
		SP0566
		SP0568
		SP0577
		SP0579
		SP0580
		SP0581
		SP0736

		SP0770 *SP0775* *SP0920* *SP1175* *SP1383* *SP1384* *SP1441* *SP1468* *SP1474* *SP1533* *SP1576* *SP1630* *SP1631* *SP1651* *SP1659* *SP1906* *SP2026* *SP2134* *SP2188* *SP2189*